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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,255	12/12/2003	Kazushi Sato	245991US6	8667

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EXAMINER	
HUNG, YUBIN	

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
09/12/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/733,255

Applicant(s)

SATO ET AL.

Examiner

Yubin Hung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because
 - Figures 1-8B and 12 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (per the brief description of the drawings). See MPEP § 608.02(g).
 - In Fig. 3 the arrow from reference numerals 2 to 4 is extraneous

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the

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applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

- P. 1, line 25: "1088" should have been "1080"
- P. 19, line 22: per P. 8, line 11 "0 – 52" should have been "0 – 51" (or vice versa)
- P. 20: "(3-4)" in line 28 should have been "(3-5)"
- Equations (2-17) & (2-18) on P. 15, equations (3-2) & (3-4) on P. 20; equations (3-7) & (3-8) on P. 23, equation (3-10) on P. 24, and equation (3-11) on P. 25: "var sbk" should have been "var_sbk"

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 3-5, 7, 8, 14-16, 18 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 8, and similarly claim 19, recites the limitations "the plurality of second blocks" in line 2. There is insufficient antecedent basis for this limitation in the claim. [Note: Per a phone conversation with applicant's representative Mr. Joseph A. Scafetta, Jr. on 08/30/07, claims 8 and 19 are interpreted as being dependent from claims 3 and 14, respectively.]

6. Claims 3, 4, 5 and 8 recites the limitations "the second block" in lines 4, 3, 2 and 3, respectively. Since a plurality of second blocks are recited in claim 3, it is not clear which of the second blocks "the second block" refers to. Therefore the mete and bound of the claims cannot be ascertained. Claims 11-16 and 19 have the same problem and are also rejected. Claims 7 and 18 inherit this problem and are rejected as well.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA (admitted prior art as disclosed in Figs. 1-8B and 12; P. 1, line 11-P. 2, line 22; and P. 5, line 26-P. 16, line 5 of the specification of the instance application) and Ribas Corbera (US 6,831,947).

9. Regarding claim 9, and similarly claims 1 and 12, APA discloses generating index data serving as an index of complexity of the image data [P. 2, lines 11-15 (activity as the index of complexity)] and a relationship between the coarseness of quantization (i.e., quantization scale) and the change amount data (i.e., change in quantization parameter) in such a way that when quantization coarseness becomes r (e.g., $r = 1.12$) times, the change amount data is increased the unit amount [P. 2, lines 19-21]. Additionally, APA also discloses that activity is computed to generate a quantizing parameter [P. 2, lines 16-18].

APA does not expressly disclose the same relationship between a complexity index and the change amount data. However, Ribas Corbera discloses having quantization scale directly proportional to a measure of activity (i.e., index of complexity). Therefore, when the relationship recited above exists between the quantization scale and the change amount data, it also exists between the index of complexity and the change amount data. Ribas Corbera further discloses changing the default (i.e., reference) quantization parameter to improve the effectiveness of quantization [Fig. 1, refs. 10-14].

Therefore it would have been obvious to one of ordinary skilled in the art to modify the APA so that the relationship recited in the claim exists between the change amount data and the index of complexity (of the image data) and to acquire the change amount data (i.e., change in quantization parameter) according to its relationship with the complexity index. The reason for doing so would have been to reduce the amount of data while suppressing the effect of image deterioration, as indicated in P. 2, lines 13-14 of APA, as well as Col. 2, lines 13-21 of Ribas Corbera.

Therefore, it would have been obvious to combine APA with Ribas Corbera to obtain the invention as specified in claim 9.

10. Regarding claim 10, and similarly claims 2 and 13, further Corbera discloses generating quantization parameter [Col. 13, lines 58-63; note that QP is the quantization parameter (see the table on Col. 6)] based on a reference value [Col. 13, lines 37-39 and 51-63; note that Q_{vbr} is the reference value and that bit rate corresponds to code amount] and of the change amount [Col. 13, lines 58-63; note that the change amount in this case is either the halving or the doubling of the reference value Q_{vbr}].

11. Regarding claim 14, and similarly claim 3, APA further discloses

- wherein the activity computing circuit computes, based on a plurality of second blocks as a unit defined within a first block of the image data, dispersion data representative of a dispersion of pixel data within the second block, and generates the index data by using a

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minimal one of the dispersion data among the dispersion data computed on the plurality of second blocks

[P. 15, line 15-P. 16, line 5, especially equations (2-17) -(2-20).

Note that var_sblk computed in equation (2-18) is dispersion data]

12. Regarding claim 15, and similarly claim 4, APA further discloses

- wherein the activity computing circuit computes the dispersion data by cumulating values depending upon a difference between pixel data within the second block and a mean value of all pixel data within the second block
[P. 15, equations (2-18) & (2-19)]

13. Regarding claim 16, and similarly claim 5, APA further discloses

- wherein the activity computing circuit computes the dispersion data based on the second block as a unit greater in size than a block serving as a unit of making an orthogonal transform on the image data
[O. 15, lines 15-18 (8x8 second blocks) and lines 25-27 (16x16 macroblocks)]

14. Regarding claim 20, and similarly claim 11, APA discloses/teaches

- an activity computing circuit to generate index data serving as an index of complexity of image data; and
a ΔQ computing circuit to define a corresponding relationship between the index data and the change amount data such that, when the index data becomes r times, the change amount data is increased the unit amount, and to acquire the change amount data corresponding to the index data generated by the activity computing circuit
[Per the analysis of claim 12]
- a quantizing parameter generator to generate the quantizing parameter based on reference data defined based on a code amount assigned to the image data as a subject of coding and of the change amount data acquired by the ΔQ computing circuit
[Per the analysis of claim 13]
- an orthogonal transform circuit for orthogonally transforming image data
[APA: Fig. 1, ref. 504]
- a quantizing circuit for quantizing image data orthogonally transformed by the orthogonal transform circuit
[APA: Fig. 1, ref. 505]
- a quantizing control circuit for controlling quantization by the quantizing circuit such that quantization coarseness is made r times as the quantizing parameter is increased a predetermined unit amount, based on the quantizing parameter generated by the quantizing parameter generator

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[APA: Fig. 1, ref. 512; note that it would have been obvious to modify this circuit to perform the functions of the activity computing circuit and the ΔQ computing circuit since they determine the information needed for rate control]

- a motion predicting/compensating circuit for generating reference image data and a motion vector, based on image data quantized by the quantizing circuit
[APA: Fig. 1, ref. 511]
- a coding circuit for coding image data quantized by the quantizing circuit
[APA: Fig. 1, ref. 506]

15. Claims 6-8 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA (admitted prior art as disclosed in Figs. 1-8B and 12; P. 1, line 11-P. 2, line 22; and P. 5, line 26-P. 16, line 5 of the specification of the instance application) and Ribas Corbera (US 6,831,947) as applied to claim 12 above, and further in view of Yamamoto et al. (US 6,078,615).

16. Regarding claim 17, and similarly claim 6, APA discloses all limitations of its parent; claim 12.

Note that per the analysis of claim 12, APA discloses adaptive quantization in which the activity computing circuit generates the index data for image data been processed and that the ΔQ computing circuit acquires the change amount data on the image data based on the index data generated by the activity computing circuit

APA does not expressly disclose that the image data comprises a first field and a second field on which the index data and the change amount data are generated/acquired.

However, Yamamoto discloses applying encoding on the field-basis [Fig. 6, refs. 12 & 14 (frame-based encoding), 21 & 28 (field-based) and 29; Col. 5, lines 18-43].

Therefore it would have been obvious to one of ordinary skill in the art to modify APA with the teachings of Yamamoto as recited above by generating the index data and acquiring the change amount data on the basis of fields so that they can be quantized differently and encoded. The reason would have been to obtain more efficient coding by choosing the smaller one of the frame- and the field-based coding results, as Yamamoto indicates in Col. 5, lines 39-43.

Therefore it would have been obvious to combine Yamamoto with APA to obtain the invention as specified in claim 17.

17. Regarding claim 18, and similarly claim 7, it is similarly analyzed and rejected as per the analyses of claim 14 ("second blocks defined within first blocks") and claim 17 ("interlaced image scanning data," since Yamamoto discloses applying encoding to odd and even fields of a frame).

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18. Regarding claim 19, and similarly claim 8, it is similarly analyzed and rejected as per the analyses of claim 14 ("computes the dispersion data on the plurality of second blocks") and claim 17 ["blocks including the second block corresponding to field coding and the second block corresponding to frame coding," since Yamamoto discloses applying encoding to frames as well as fields; see Fig. 6, refs. 12 & 14 (frame-based encoding), 21 & 28 (field-based) and 29; Col. 5, lines 18-43].

Conclusion and Contact Information

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Yanagihara (US 5,374,958) – discloses having quantization step size proportional to an activity code
- Yamashita et al. (US 6,137,835) – discloses applying adaptive quantization to multiple fields
- Chung et al. (US 5,699,119) – discloses using activity to control quantization
- Ryoo (US 5,990,957) – discloses calculating quantization step size adjustment based on complexity, among other things
- Sugiyama et al. (US 2004/0114686) – discloses calculating field activity to control quantization

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20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C. Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Yubin Hung', with a long horizontal flourish extending to the right.

Yubin Hung
Patent Examiner
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September 4, 2007